

## CLAIMS

1. A process for generating an output MPEG bitstream from an MPEG input bitstream, said output MPEG bitstream having at least one entity chosen among syntax, resolution, and bitrate modified with respect to said input bitstream, the process comprising:

distinguishing, in said input bitstream, non-affecting portions that substantially do not affect variation in bitrate and affecting portions that substantially do affect variation in bitrate;

when said syntax is to be modified between said input bitstream and said output bitstream, subjecting said non-affecting portions of said input bitstream to translation of said syntax into the syntax of said output bitstream and transferring said non-affecting portions subjected to syntax translation to said output bitstream;

when said resolution is to be modified between said input bitstream and said output bitstream, subjecting said non-affecting portions of said input bitstream to translation of said resolution into the resolution of said output bitstream and transferring said non-affecting portions subjected to the resolution translation to said output bitstream;

transferring said affecting portions from said input bitstream to said output bitstream in substantial absence of processing operations when said resolution is left unaltered between said input bitstream and said output bitstream; and

when said resolution is modified between said input bitstream and said output bitstream, subjecting said affecting portions of said input bitstream to a filtering in the domain of the discrete cosine transform, then transferring said affecting portions subjected to filtering in the domain of the discrete cosine transform to said output bitstream.

2. The process according to claim 1, wherein said non-affecting portions and said affecting portions of said input bitstream are distinguished by parsing headers of said input bitstream.

3. The process according to claim 1, further including an operation of carrying out a scaling of a motion field to enable association to pixel macroblocks having a resolution corresponding to the modified resolution of said output bitstream when said resolution is to be modified between said input bitstream and said output bitstream.

4. The process according to claim 3 wherein said scaling of the motion field includes an operation of applying to motion vectors associated with said input bitstream a transformation that correlates the motion vectors to a given number of motion vectors associated with at least one of the macroblocks chosen in the set made up of:

macroblocks that are to be merged into a new macroblock; and

macroblocks that surround the ones that are to be merged into the new macroblock.

5. The process according to claim 4 wherein said transformation applied to the motion vectors associated with said input bitstream comprises the operations of:

multiplying said motion vectors by respective weighting factors;

accumulating the results of the above multiplication; and

dividing the results accumulated by the sum of said weighting factors.

6. The process according to claim 1 wherein said filtering operation in the domain of the discrete cosine transform comprises the operations of:

storing a given number of macroblocks aligned on one and the same line; and

multiplying said macroblocks by at least one matrix with a scaled definition factor.

7. The process according to claim 6 wherein said given number of aligned macroblocks are aligned on one and the same horizontal line, and in that said definition factor is scaled in the horizontal direction.

8. The process according to claim 6 wherein said given number of aligned macroblocks are aligned on one and the same vertical line, and in that said definition factor is scaled in the vertical direction.

9. The process according to claims 6, further comprising the operation of storing both a given number of macroblocks aligned on one and the same horizontal line and a given number of macroblocks aligned on one and the same vertical line, so that said definition factor is scaled both in the horizontal direction and in the vertical direction.

10. The process according to any one of claims 6 wherein said given number of macroblocks comprises at least three macroblocks.

11. The process according to claim 3 wherein said macroblocks with modified resolution undergo VLC coding before being transferred to said output bitstream.

12. The process according to claim 1, further comprising an operation of selectively varying a quantization-scaling code between said input bitstream and said output bitstream.

13. A system for generating an output MPEG bitstream from an input MPEG bitstream, said output MPEG bitstream having at least one entity chosen among syntax, resolution, and bitrate modified with respect to said input bitstream, the system comprising:

a sorting module configured to distinguish in said input bitstream, first portions and second portions that respectively substantially do not affect and do affect the variation in bitrate;

a syntax module configured to subject said first portions of said input bitstream to the translation of said syntax into the syntax of said output bitstream, said syntax module configured to transfer said first portions subjected to syntax translation to said output bitstream when said syntax is to be modified between said input bitstream and said output bitstream;

a resolution module configured to subject first portions of said input bitstream to the translation of said resolution into the resolution of said output bitstream, said resolution module configured to transfer said first portions subjected to resolution translation to said output bitstream when said resolution is to be modified between said input bitstream and said output bitstream;

a transfer line configured to transfer said second portions from said input bitstream to said output bitstream in the substantial absence of processing operations when said resolution is to be left unaltered between said input bitstream and said output bitstream; and

a processing set configured to subject said second portions of said input bitstream to a filtering in the domain of the discrete cosine transform and configured to transfer said second portions subjected to filtering in the domain of the discrete cosine transform to said output bitstream when said resolution is to be modified between said input bitstream and said output bitstream.

14. The system according to claim 13 wherein said sorting module is configured to distinguish between said first portions and said second portions of said input bitstream by parsing headers of said input bitstream.

15. The system according to claim 13 wherein said processing set includes at least one element configured to scale a motion field in order to enable association to pixel macroblocks having a resolution corresponding to the modified resolution of said output bitstream.

16. The system according to claim 15 wherein said at least one element is configured to apply to motion vectors associated to said input bitstream a transformation to correlate the motion vectors to a given number of motion vectors associated to at least one of the macroblocks chosen in the set made up of:

macroblocks that are to be merged into a new macroblock; and

macroblocks that surround the macroblocks that are to be merged into the new macroblock.

17. The system according to claim 16 wherein said at least one element is configured to:

multiply said motion vectors by respective weighting factors;  
accumulate the results of the above multiplication; and  
divide the results accumulated by the sum of said weighting factors.

18. The system according to claim 13 wherein said processing set to execute said filtering in the domain of the discrete cosine transform by being further configured to:

store a given number of macroblocks aligned on one and the same line; and  
multiply said macroblocks by at least one matrix with a scaled definition factor.

19. The system according to claim 18 wherein said processing set is further configured to execute said filtering such that said given number of aligned macroblocks are aligned on one and the same horizontal line, and such that said definition factor is scaled in the horizontal direction.

20. The system according to claim 18 wherein said processing set is further configured to execute said filtering such that said given number of aligned macroblocks are aligned on one and the same vertical line, and such that said definition factor is scaled in the vertical direction.

21. The system according to claim 18 wherein said processing set is configured to carry associated storage elements configured to store both a given number of macroblocks aligned on one and the same horizontal line and a given number of macroblocks aligned on one and the same vertical line, so that said definition factor is scaled both in the horizontal direction and in the vertical direction.

22. The system according to claim 18 wherein said given number of macroblocks includes at least three macroblocks.

23. The system according to claim 15, further comprising a VLC coding module configured to subjecting said macroblocks with modified resolution to VLC coding before said macroblocks are transferred to said output bitstream.

24. The system according to claim 13, further comprising a variator module configured to selectively vary a quantization-scaling code between said input bitstream and said output bitstream.

25. A computer program product directly loadable in the memory of a digital computer and comprising software code portions for causing a computer to generate an output MPEG bitstream from an MPEG input bitstream, said MPEG output bitstream having at least one entity chosen among syntax, resolution, and bitrate modified with respect to said input bitstream, by:

distinguishing, in said input bitstream, non-affecting portions that substantially do not affect variation in bitrate and affecting portions that substantially do affect variation in bitrate;

subjecting said non-affecting portions of said input bitstream to translation of said syntax into the syntax of said output bitstream by transferring said non-affecting portions subjected to syntax translation to said output bitstream when said syntax is to be modified between said input bitstream and said output bitstream;

subjecting said non-affecting portions of said input bitstream to translation of said resolution into the resolution of said output bitstream by transferring said non-affecting portions subjected to the resolution translation to said output bitstream when said resolution is to be modified between said input bitstream and said output bitstream;

transferring said affecting portions from said input bitstream to said output bitstream in substantial absence of processing operations when said resolution is left unaltered between said input bitstream and said output bitstream; and

subjecting said affecting portions of said input bitstream to a filtering in the domain of the discrete cosine transform, then transferring said affecting portions subjected to filtering in the domain of the discrete cosine transform to said output bitstream when said resolution is to be modified between said input bitstream and said output bitstream.

26. The computer program product of claim 25, wherein said non-affecting portions and said affecting portions of said input bitstream are distinguished by parsing headers of said input bitstream.

27. The computer program product of claim 25, further causing the computer by scaling a motion field to enable association to pixel macroblocks having a resolution corresponding to the modified resolution of said output bitstream when said resolution is to be modified between said input bitstream and said output bitstream.

28. The computer program product of claim 27 wherein said scaling of the motion field includes an operation of applying to motion vectors associated with said input bitstream a transformation that correlates the motion vectors to a given number of motion vectors associated with at least one of the macroblocks chosen in the set made up of:

macroblocks that are to be merged into a new macroblock; and

macroblocks that surround the ones that are to be merged into the new macroblock.

29. The computer program product of claim 28 wherein said transformation applied to the motion vectors associated with said input bitstream comprises the operations of:

multiplying said motion vectors by respective weighting factors;

accumulating the results of the above multiplication; and

dividing the results accumulated by the sum of said weighting factors.

30. The computer program product of claim 25 wherein said filtering in the domain of the discrete cosine transform comprises:

storing a given number of macroblocks aligned on one and the same line; and  
multiplying said macroblocks by at least one matrix with a scaled definition factor.

31. The computer program product of claim 30 wherein said given number of aligned macroblocks are aligned on one and the same horizontal line, and in that said definition factor is scaled in the horizontal direction.

32. The computer program product of claim 30 wherein said given number of aligned macroblocks are aligned on one and the same vertical line, and in that said definition factor is scaled in the vertical direction.

33. The computer program product of claim 30, further causing the computer by storing both a given number of macroblocks aligned on one and the same horizontal line and a given number of macroblocks aligned on one and the same vertical line, so that said definition factor is scaled both in the horizontal direction and in the vertical direction.

34. The computer program product of claim 30 wherein said given number of macroblocks comprises at least three macroblocks.

35. The computer program product of claim 27 wherein said macroblocks with modified resolution undergo VLC coding before being transferred to said output bitstream.



36. The computer program product of claim 24, further causing the computer by selectively varying a quantization-scaling code between said input bitstream and said output bitstream.